approach

DECEMBER 1983 THE NAVAL AVIATION SAFETY REVIEW

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Reflections on 1983 Approach Reader Survey

OUR thanks to the more than 200 readers who took the time and effort to fill out and submit reader survey forms. We heard from members of all our sister services, other governmental agencies and the civilian sector. We were elated to find that 95 percent plus of the respondents find Approach to be both an interesting and useful aviation safety magazine. In order to avoid the taint of false modesty, some of the superlatives heaped on Approach are quoted below:

"I commanded two squadrons. Required reading was an Approach article published in the November 1964 issue entitled 'Twilight Zone.' I believed strongly in the analysis of human cause factors set forth in this article. My ASOs were directed to follow through with presentations on each factor. Both squadrons (carrier based) were accident-free during my tenure as CO." (Submitted by an admiral).

"Good magazine. If a 'blackshoe' likes it, it must be good. Wish the 'shoes' would print 'there I was' stories."

"We've got a good thing going with Approach. I have Air Force and foreign friends who beg for my copy when I've finished with it."

"In 20 years of active and reserve duty as an NFO/TACCO in VP, I have always found Approach to be a useful and valuable publication. Each month's issue is eagerly awaited and read cover to cover. As Director of Administration, flying for TWA and for the past year, Editor of Flite Facts, the Approach articles are found to have merit in commercial aviation also. Aviation safety is aviation safety no matter what type of flying is being done."

"Approach is a 4.0 publication and has been since its inception. I have read it as a student naval aviator, preached it as a safety officer and prayed with it as a squadron CO. Bravo Zulu."

"The Approach approach to aviation safety is still, by and large, the best, most refreshing in aviation annals. I am fortunate to still have access to this fine magazine which provides me with useful information and a bit of nostalgia. Thanks. (O-6 in a sister service but U.S. Navy at heart)"

Now that we've gotten the kudos out of the way, let's address some of the more critical and repeated comments submitted in regard to areas Approach shies away from in presenting important aviation safety issues.

"Crew rest versus 'getting the X in the square.' Some commands seem more concerned about the X, not whether or not the student is ready."

"Command pressure to fly an aircrew in an unsafe aircraft. This is an unpopular subject that needs more attention."

"The push by the 'heavies' to get the mission accomplished at all costs."

"There is a great tendency in naval aviation to gripe 'supervisory error!' However this seems to be avoided when it involves command authority. What's wrong with calling a spade a spade? If the CO blew it, say so."

There were many other comments which more or less paralleled the above. Instead of answering each of these comments individually, we felt that an article addressing the entire area would be beneficial. Therefore, the lead article this month entitled "Expediency" by Russ Forbush is designed to do just that.

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inside approach

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A-6 painting by Blake Rader of the Approach staff.

ARTICLES

DEPARTMENTS

Commodore Jerry C. Breast, Commander, Naval Safety Center
Capt. H.A. Petrich, Chief of Staff
Capt. J.C. Smith, Director, Aviation Safety Programs
Cdr. C.E. McCaskill, Head, Safety Publications
Lt. John M. Flynn, Editor

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Expediency

By Russ Forbush
Approach Writer

EXPEDIENCY: Haste, dispatch, push, drive, you name it — the end result is adherence to means and methods which are opportune or temporarily advantageous as distinguished from those that are right.

The practice of expediency creeps into daily operations and costs naval aviation dearly in terms of safety and readiness. The reasons for this vary but foremost is the fact that expediency comes in a variety of disguises and is often difficult to recognize for what it is.

Disguise No. 1 — *The Impulse*

Expediency shows up regularly disguised as a great idea, a sudden inspiration, or in more every day language, as an **impulse**. This is the same feeling which moves scientists to shout, "Eureka! I've got it." This feeling may be welcome in a laboratory but in the business of flying it is a killer. Acting on impulse — either yours or someone else's — may produce a short-term gain, but it could also have a tragic aftermath. To illustrate:

A flight of two A-6s was scheduled for a simulated strike at an inland target. The target was in a lake which also happened to be a favorite fishing spot for local residents. After arriving in the area and obtaining clearance from the target control center, the A-6 pilots proceeded to visually clear the target before making their runs. Several small boats were spotted in the immediate target area. After repeated passes, all but one of the boats departed the area. The target controller was notified of the problem, whereupon he promptly advised the flight leader to "drop an Mk-76 alongside him to see if that will move him." Fortunately, this impulsive advice fell on deaf ears. The flight leader rejected

it with a curt "negative" and continued to make dry runs until the boat finally departed the area. As the flight leader later observed, it would have been expedient to follow the controller's advice but any gain achieved thereby would most certainly have been of a temporary nature. The ultimate cost might have been outrageously high.

Disguise No. 2 — *The Easy Way*

Expediency often shows up disguised as the **easy way** to do things. Self-satisfaction often aids and abets this deception. Examples of the unwary getting sucked into doing things the easy way instead of the right way are abundant. They include:

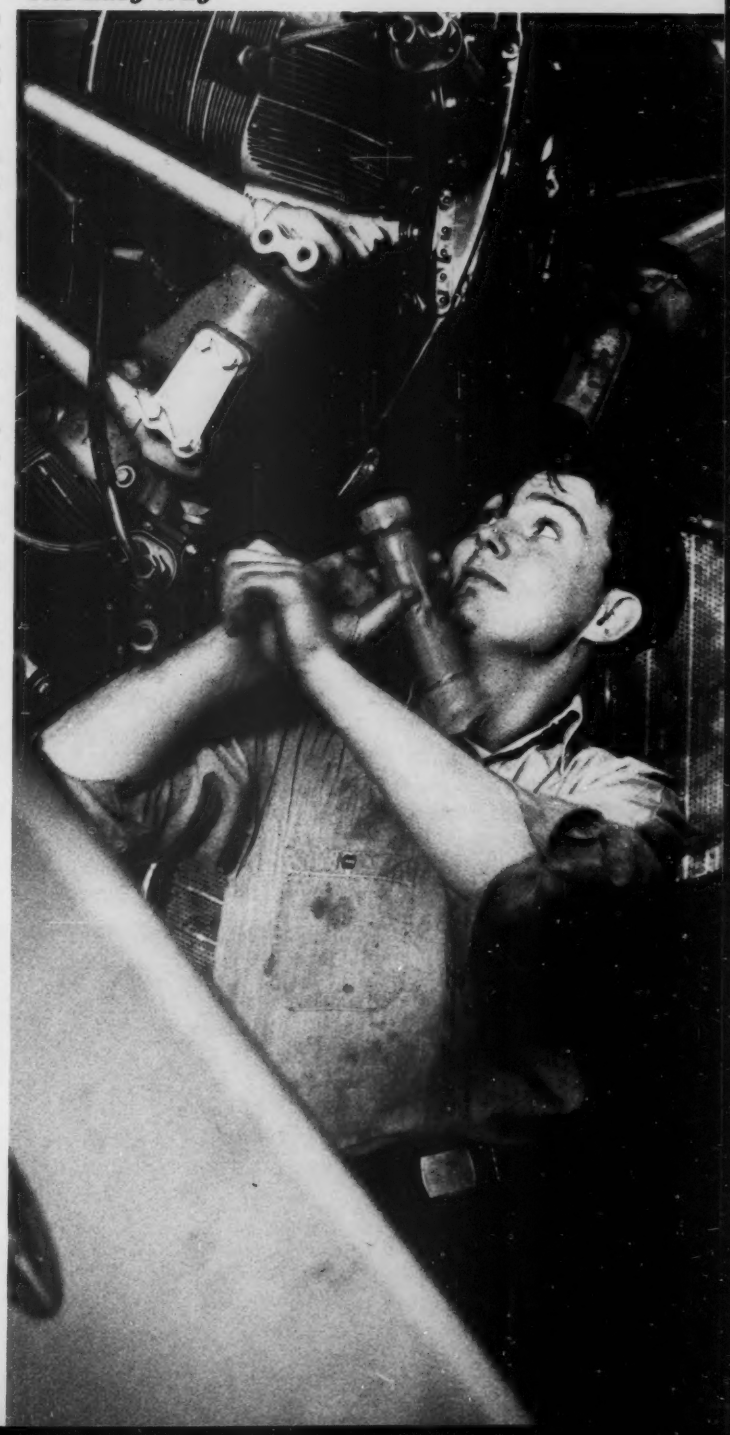
- The unlicensed driver who undertakes operation of a piece of ground support equipment (GSE) in order to start an aircraft without delay.
- The maintenance supervisor who permits an aircraft to be moved without the required wingwalkers and brakeriders.
- The maintenance man who performs an intricate task without reference to the Maintenance Instruction Manual (MIM).
- The pilot who rushes his flight planning or preflight so as not to delay the flight.
- The new XO who takes over as flight leader on a difficult mission before he's reached the proper level of competence.

A more specific example of the hazards of attempting to do things the easy way instead of the right way involved both a pilot and a plane captain. A jet aircraft was started, pretaxi checks completed and the plane captain attempted to remove the chocks. However, he discovered that the port chock would not budge. Maintenance personnel had recently changed the port tire and had lowered the tire in such a way as to make chock removal difficult, if not impossible.

The plane captain surveyed the situation and decided to have the pilot taxi the aircraft over the chock. At the plane captain's direction, the pilot added excessive power to move the aircraft. Not only did this attempt fail, but the resultant jet blast caused considerable damage to another aircraft positioned on the line to the rear.

Many shortcuts are attempted without any deliberate, wrongful intent on the part of the people involved. On the contrary, these individuals are usually sincere in the belief that a real, permanent gain in time or effort will result. Being optimistic by nature, they are able to discount the knowledge that similar shortcuts have led to trouble in the past and rationalize that "it can't happen to me." And they may be right too — up to a point. A given individual may be able to shortcut many times without suffering the consequences. But at best, this is a provincial view. When the broad view is taken, it's easy to see that with our large number of naval aviation personnel, there is likely to be an immediate catching up of the law of averages when shortcuts are practiced on a widespread basis. It's a simple matter of exposure.

Continued



The Master Disguise

Damage caused by expediency disguised as an impulse or the easy way to do things is small potatoes compared to the damage it does in its master disguise — the "can-do" spirit. At one time or another, the practice of expediency in the name of "can-do" has led to a host of problems, including:

- Inadequate crew rest.
- Scheduling pilots and aircrew for missions beyond their capabilities.
- Boring holes to break existing flight time records.
- Uncontrolled cannibalization.
- Flying aircraft with major discrepancies.
- Failure to perform required functional checks upon completion of maintenance.
- Inadequate mission planning.
- The continuation of marginal pilots in stage.
- The disruption of effective training problems.

These problems come about not because the individuals involved do not care, but rather because they do care. They care about getting the job done.

It's difficult to pin down the exact process by which conscientious and capable people get sidetracked into the practice of expediency but there is not doubt that it's an insidious process.

Let's look at one troublesome can-do area — noncomformance with the mission essential matrix system (MESM). Several mishaps have occurred during the past few years where one of the cause factors involved flying an aircraft without the availability of mission-essential equipment. The usual comment in the mishap investigation report (MIR) is "the crew should not have accepted the aircraft" or "maintenance control should not have released it." But is this really the whole story? Isn't what crews are willing to accept and what maintenance control releases for flight a reflection of the standards and priorities set by the unit commander and the degree to which they are adhered to by unit supervisors?

When operations and maintenance are squeezed or pushed by external or internal pressures, compromises have to be made. If the schedule is compromised, there will be less output produced (quantity). This is a hard and unpopular compromise to make. So the desire to maintain output may tempt the unit to borrow on the future — in other words, to support this week's schedule with next week's maintenance. The only way this can be done is to compromise standards (quality).

There are two good reasons why this is counter-productive. First, there is a strong possibility that a malfunctioning or not fully equipped aircraft will get into a situation where failure or nonavailability of the "deferred" or "awaiting parts" system leads to an emergency which results in a mishap. Second, you have to pay back what you borrow, and maybe some more besides. Carrying this week's gripes doesn't mean just twice as much work next week — it could mean three or four times as much work next week. And the interest on what is borrowed invariably has to be paid from the unit's output. So the unit ends up having to compromise next week's schedule anyway and then loses more output next week than it saved this week. Remember, you can't get something for nothing in this business, or any other business for that matter. If you try you may well lose something — or someone.

The practice of expedience (by whatever name) carried to extremes can lead to the loss of lives or material without any compensatory gain. Referring to an aircraft's envelope is common in naval aviation, but how often do we refer to the human envelope? Each of us has our own. The nugget performs within a smaller human envelope than the second-tour aviator. The new man on the maintenance line and in the control tower operates in a smaller envelope than his experienced shipmate. As experience is gained, the human envelope expands. But, regardless of how experienced and qualified we become when we exceed our envelope, danger lurks ahead.

In these austere times, it seems that naval aviation is being called upon to do more and more with less and less. This belt tightening tends to focus attention on pressing day-to-day problems and commitments — and this may create a tendency to go for short-range solutions rather than gearing for the long haul. But don't be misled. Expediency is the antithesis of true efficiency. It compounds problems rather than solving them.

The "can-do" spirit is the most valuable ingredient in naval aviation. It is "the right stuff" that wins wars, but don't cripple it by the practice of unnecessary expediency. ◄

The Delphi Technique

By Cdr. Mike Suldo, Safety Officer
Helicopter Tactical Wing One

THE technique is called "Delphi." It was started in the 1950s by the Rand Corporation (a "think tank") to "obtain the most reliable consensus of opinions of a group of experts . . . by a series of intensive questionnaires interspersed with controlled opinion feedback."[1]

Its accuracy over mid- (three months to two years) and long- (72 years) term forecasts rates from fair to very good.

The technique works best when:

- the problem doesn't lend itself to precise analytical techniques.
- the discussion tends to be dominated by particularly strong personalities.

A guide to the technique might be:

1. Decide upon the subject/general goals.
2. Select a panel of representative experts.
3. Develop the first round questionnaire.
4. Test the questionnaire for ambiguity.
5. Give questionnaire to panelists.
6. Analyze and discuss first round response.
7. Prepare next round questionnaire.
8. Administer next round questionnaire.
9. Analyze and discuss next round questionnaire (continue 7 through 9 until answers stabilize).
10. Present and act upon conclusions (action: safety officer and commanding officer).

An HS squadron scenario might have the XO convene a panel of 10 squadron experts such as:

- Maintenance officer
- QA officer
- NATOPS officer
- Master chief petty officer of the command
- Senior aircrewman
- High flight-time aircrewman
- Senior Lt. HAC
- Safety officer
- Aircrew NATOPS petty officer
- High flight-time pilot

The XO explains that he is handing out a questionnaire to be done and returned in three days. After collecting them, he tabulates the data and presents it to the group for discussion. The questionnaire acts as a focal point.

Everyone discusses the results and receives a common base of information. Since the questionnaires are not signed, no one is tied to a particular viewpoint and required to defend it. Everyone in the group gains access to the information of everyone else.

After the initial discussion, a second, refined, questionnaire is handed out, completed and discussed. This process is continued until the desired degree of refinement is reached.

In our example scenario, the safety officer and CO could have a way of identifying a potential problem area in squadron ops and see if they should alter either procedures or policy to improve the result.

This same technique could be applied in other areas, including retention or shop safety. Indeed, the possibilities are limitless. ◄

Reference: [1]*The Delphi Method, Techniques and Applications,* Linstone & Turoff (ed), (Reading, MA, 1978, Addison Wesley)

First Questionnaire

In what regime and for what reason do you expect the next major squadron mishap? (Regime and reason not mutually exclusive.)

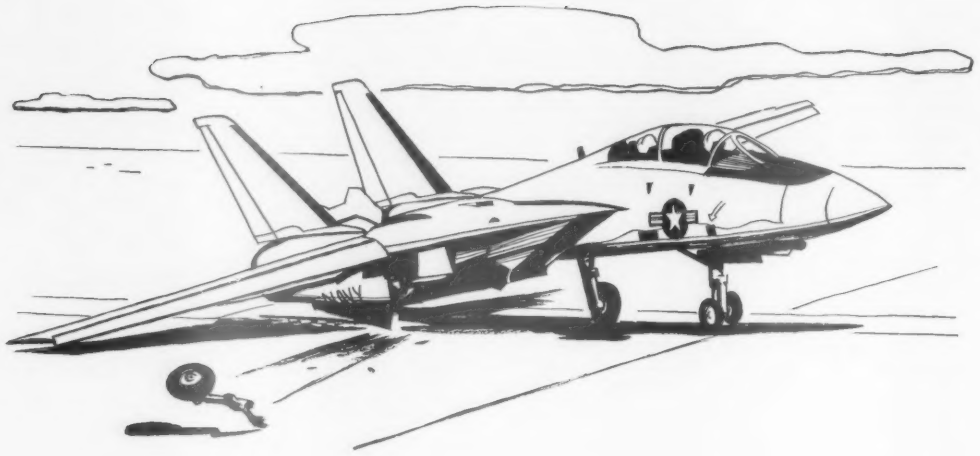
	Probability				
	10	25	50	75	100
Overwater, day (not ship)					
Overwater, night (not ship)					
Ship, day					
Ship, night					
Overland, day					
Overland, night					
Instrument, day or night					
PMFCF					
Training hop					
SAR mission					
Reason	10	25	50	75	100
Crew error					
Maintenance error					
Supervisory error					
Material failure					

Second Questionnaire (assuming ship/day and pilot factors had been positively identified by first questionnaire)

In what area of ship ops and because of what pilot problem do you think we will sustain from our next major mishap?

	Probability				
Ship/Acft Factors	10	25	50	75	100
CV ops					
Ops with Coast Guard boat					
SAR ops with civilian craft					
CV T/O					
CV landing					
Ops in CV pattern					
Ammo offloads and onloads with frigates					
Pilot Factors					
Preflight					
Mental state (hung over, tired, etc.)					
Skill, lack of (poor training)					
Qualifications					
Experience level					

(Questionnaires continue to zero in on problem area.)



One of Our Mainmounts is Missing. On the ninth landing of a night FCLP period at an outlying field, Lt. Dave Jancarski and Lt. John Miller felt their F-14 Tomcat's right wing drop followed by a call from the LSO stating that there were sparks coming from the starboard main landing gear. After becoming airborne, an inspection by another squadron aircraft revealed that the starboard mainmount was canted approximately 45 degrees from the vertical plane.

The aircrew proceeded towards home field, contacted the tower and declared an emergency. En route, they confirmed the exact nature of the problem and consulted the NATOPS Pocket Checklist for the proper landing procedures. The arresting gear was removed from the approach end of the runway and an LSO was requested. On final landing the starboard mainmount separated from the aircraft, causing severe directional problems on rollout. Displaying superb judgment and airmanship, Jancarski succeeded in maintaining directional control and prevented the aircraft from leaving the runway.

Postflight inspection revealed that the starboard shock strut trunnion had broken just above the axle. The cause was determined to be material failure.

A well-done to this heads-up aircrew.

No Room For Error. A couple of EA-6Bs were in the pattern for recovery aboard the carrier. During the prerecovery brief, the decision was made by flight deck control to taxi these aircraft into what is known as a reverse spot of the one row on the bow, with final spot being along the "point" (an area of the flight deck on the starboard side forward of the No. 1 elevator). This allowed the Prowlers to start and taxi rather than be respotted for the next launch, a scheduled EA-6 CQ period.

The first Prowler, which we'll call 601, was recovered, taxied forward onto the bow, reversed by an experienced director and spotted on the "point" without incident. A plane director-in-training observed this evolution and signaled that he would reverse the next EA-6 himself. At the same time, flight deck control called for the second Prowler (we'll call 602) to be spotted all the way forward on the bow since the "point" was full. This signal was not picked up by the flight deck chief spotting the deck or the plane director-in-training. Without this info, the flight deck chief directed that 602 be reversed on the bow in the same manner as 601. Prior to the EA-6 landings, other aircraft had been recovered and limited the available space for aircraft being taxied and turned on the bow. After taxiing aircraft 602 forward between cats 1 and 2, the plane director-in-training then signaled 602 for a hard right turn.

The trainee director had positioned himself too far starboard to observe that 602's left horizontal stabilizer was moving perilously close to aircraft parked along cat. 2. The flight deck officer then noted that 602 was too far port so he called out three times on the mouse, "Watch out for the tail." At this point, 602's port horizontal stabilizer contacted an S-3, shattering the copilot's windscreen. The estimated cost of damage caused by this mishap amounted to over $16,000.

The factors follow:

The plane director-in-training was

AIR BREAKS

not properly positioned to observe that 602 was too far port to make a hard right turn without impacting aircraft parked along cat. 2. He was too inexperienced for the job and was not being supervised.

Flight deck control's instructions to reverse aircraft for the next go included the assumption that the reverse start would not take place forward of the point area.

The Fly petty officer was responsible for ensuring the proper supervision of the director trainee by providing an experienced director to back him up. The backup director can be expected to intervene should an unsatisfactory situation develop. Additionally, allowing a trainee with only four days experience to conduct a reverse start spot on the bow, a demanding maneuver for even an experienced director, showed a definite lack of judgment on the part of this supervisor.

The pilot of 602 should have been more alert to the tight turn he was asked to initiate. Also, other aircrew personnel could have assisted the pilot through better communications with him.

Compressor Stalls, but not the Pilot. Lt. Pat O'Keefe, a VA-174 instructor pilot, and Ltjg. Hodges, a replacement pilot, launched from NAS Cecil Field in their A7E Corsairs for a tactical training hop at Rodman Target, 45 nm south of Cecil. The flight was flown as briefed and the required eight section roll-in maneuvers were completed. Hodges was then instructed to orbit the target at 14,000 feet while his leader practiced 45-degree dive bomb deliveries.

During his second run, passing 7,000 feet, O'Keefe became aware of a series of popping sounds and slight engine vibrations. The bombing run was abandoned; the throttle was moved to IDLE, and MANUAL fuel selected in an attempt to clear the compressor stalls. Airspeed was 450 knots. The engine temperature was much higher than normal. With the nose slightly above the horizon, O'Keefe commenced a turn toward NAS Cecil Field, the closest suitable divert airfield.

After completion of the turn at 300 knots and 4,000 feet, he determined that very small throttle movements produced an increase in the intensity of the compressor stalls. Engine temperatures were climbing close to the maximum permissible. O'Keefe decided that the only hope of clearing the stalls and returning safely to NAS Cecil was to shut down the engine and attempt a relight. After completing the emergency procedures, with altitude and airspeed decreasing, the throttle was moved to OFF; the engine wound down and the stalls ceased. Engine relight was successful and power was increased very carefully to 80 percent rpm, sufficient to establish a gentle climb towards home plate.

O'Keefe flew a straight-in precautionary in to a short field arrest without moving the throttle until over the runway threshold. When the throttle was placed at IDLE, compressor stalls returned and persisted until the engine was shut down. O'Keefe's reaction to the emergency was correct, professional and prevented the loss of a valuable A7E aircraft.

Rudder Trim Attaboy. Immediately after takeoff, Cdr. Frank Miley, CO, and Ltjg. Denny Fitzgerald of VAW-112 noticed that their E-2C was not responding to left rudder trim inputs. The rudder trim indicator showed full right rudder, and both pilots' rudder trim switches were ineffective.

The aircraft was controllable while climbing at 150 knots, but at normal cruise the ball was all the way to the left. Attempts to recycle the rudder trim circuit breakers were unsuccessful.

To maintain balanced flight, both pilots had to stand on the left rudder. Miley was flying the aircraft from the right seat. An emergency was declared and preparations were made for a short field arrested landing at NAS Miramar with the CVW-9 LSO on station.

The aircraft was slow flighted with one-third flaps and an airspeed of 130 knots. This configuration was the easiest to fly although still requiring left rudder input from both pilots. The aircraft was successfully arrested.

The crew would have had great difficulty waving off or making a left turn, and almost no single-engine capability if the starboard engine had failed. The emergency was caused by a failed rudder trim actuator.

We Got Power if You Need It. During a student training flight on 25 March 1983, Lt. Paul Wilhelm and Ltjg. Schultz of VT-25 were confronted by a throttle linkage failure in their TA-4J with the engine set at MILITARY power. Wilhelm immediately discontinued the exercise, locked the throttle in place with the friction adjust, selected fuel control to MANUAL and turned toward Chase Field.

He declared an emergency, informed Chase Approach Control that he intended to shoot a stuck throttle approach to an arrested landing and requested an LSO to be standing by. With gear and flaps down, Wilhelm executed a flawless stuck throttle approach, securing the engine at 200 feet AGL and deadsticking the TA-4 to a successful arrested landing. Postflight examination revealed the throttle linkage failure was due to excessive wear on the serrated teeth of a spacer on the fuel control unit. A well-done and an Attaboy to this aircrew. ◄

Declare the Emergency

By R.A. (Chick) Eldridge
Approach Writer

The fuel gauges in both cockpits indicated less than 100 pounds.

IT was an innocuous beginning for an episode which was to "turn to worms" before the day was over. The flight was planned for two legs, the first a takeoff from NAS East Coast to Southeast AFB and the second leg terminating at homebase, NAS Southwest. The student pilot of the TA-4J planned both legs of the flight.

On the first leg everything went according to the flight plan. Flight planning for the second leg was changed by the instructor pilot because of predicted thunderstorm activity along the previously planned route. On the second leg, the instructor pilot occupied the front seat.

As the two pilots passed point "C" on their route, their fuel gauges read 2,600 pounds. The decision to divert from the planned route to homebase was to be made at point "D" or with 2,200 pounds of fuel remaining, whichever came first. About four minutes after passing point "C," the pilots noted the fuel gauge reading 1,400 pounds instead of the expected 2,400 pounds. The instructor assumed the aircraft was experiencing an uncommanded fuel dump and took control.

At this point the distance to homebase was 103 miles. When the fuel gauge discrepancy was discovered, the nearest divert field was an Air Force Base 55 miles away. There was no divert chart in the aircraft for the VR route being flown, and the pilots were unfamiliar with the divert information depicted on the strip charts they were using.

Initial contact with NAS Southwest Approach Control was made at FL190 with 600 pounds of fuel indicated. The instructor declared minimum fuel and estimated their position at 35 miles northwest of the field. A later analysis determined that their position was 95 miles away from the field vice 35.

Because the instructor did not declare an emergency, the approach controller only extended his radar scope out to 60 miles upon initial contact. He was unaware of the critical fuel problem. Five minutes after initial contact with NAS Southwest Approach Control, the pilot reported 0 + 25 fuel remaining. At this time Approach Control considered the TA-4 to be in an emergency situation *although the instructor still had not declared one.* Radar contact was made at 53 miles, and the instructor stated he had 0 + 15 fuel remaining and, "We might have to go emergency fuel here."

As the pilots were heading directly for the field, Approach Control informed them that they were passing a municipal airport. When questioned as to the runway's length, Approach stated it was 4,500 feet long. When five miles from NAS Southwest, the instructor informed Approach Control that he was going to land at the municipal field. The fuel gauges in both cockpits indicated less than 100 pounds.

A modified high, fast, idle power approach was made to the runway with flaps and speedbrakes extended. The landing gear was lowered when the runway was made. Touchdown was made approximately one-third the way down the runway. The pilot applied maximum braking after touchdown and skid marks continued to the end of the runway. The instructor initiated command ejection after the aircraft left the runway and was approaching a road where traffic was sighted and an embankment appeared dead ahead. Both ejections were normal with each pilot receiving only a minor injury. At the time of ejection the aircraft was traveling at 40 to 50 knots.

In analyzing the mishap, it was discovered that the squadron had experienced 11 instances of uncommanded fuel dump in the previous nine months. A Douglas Aircraft tech rep provided the following sequence of events as the most probable cause for the uncommanded dump.

During normal flight, with a minimum engine RPM of 80-85 percent, bleed air is supplied to the droptanks at 9-10 psi. So long as fuel is being transferred from the droptanks, this pressure is not transmitted to the wing tank because the wing fuel shutoff valves secure fuel flow when the wing is full. When the droptanks are empty, air pressure enters the fuel feed lines and the wing since the shutoff valves remain open if the wing is not full. Normally this pressure would vent directly to the atmosphere through the vent hole in the front right side of the wing tank, through the pressure-and-vent valve and finally out the external vent mast. During any turbulence or maneuvers, other than smooth 1G coordinated turns, it's possible for fuel to block or enter the vent line, thus increasing pressure in the wing tank.

The dump valve has an overpressure feature that causes it to open at 8.5 to 9 psi and close at 4 psi. Therefore, even without malfunctions, it is possible to have an uncommanded dump if the droptanks remain pressurized when empty and the vent line becomes clogged with fuel. *Current NATOPS and maintenance publications do not describe this problem.*

Because of this lack of information, depressurization of the droptanks has not been emphasized in the squadron. In flight, pilots secure droptank pressure when specified in NATOPS, i.e. prior to maneuvers which could result in a departure. Any other time it has been pilot preference.

Other TA-4 squadrons were queried, and none reported having had significant uncommanded fuel dump problems. However, their squadron procedures emphasize depressuring droptanks in flight when transfer is complete. A recommendation was made to evaluate such a scenario of fuel dump problems, and to develop airframe changes, maintenance procedures and NATOPS procedures which will resolve the problem.

Both the squadron standard operating procedure (SOP) and the flight training instruction (FTI) required that this crew carry an operational navigational chart (ONC) covering the route and possible divert fields. These two pilots were only carrying stripped tactical pilotage charts (TPCs). Due to their scale, the area covered by the TPCs was too small to include divert fields. There were divert arrows on the TPCs, but there were no indications what fields they pointed to. The point "E" divert was to an Air Force base, but the crew thought it was to NAS Southwest. The AFB would have been 60 miles closer.

The Bingo profile flown by the instructor was not the one shown in the appropriate NATOPS Manual charts. To attain the maximum range profile, the aircraft should have been flown at 310 KIAS which should have attained an altitude of 33,000 to 34,000 feet. Instead the TA-4 was flown at 200 KIAS to FL190 where leveloff occurred. Had the requirement to discuss emergency Bingo and maximum range profile been complied with, both pilots would have been familiar with the procedures.

One of the biggest factors affecting the outcome of this mishap was a reluctance to declare an emergency when faced with that fact. The approach controller would have had the crew squawk EMERGENCY and would have expanded his radar scope range to a greater distance enabling the mishap aircraft to be picked up much earlier. At that point they most likely would have been advised to divert to the AFB.

One additional fact which did not enhance the emergency was that the spoilers were apparently left in the down position upon landing. The minimum landing distance technique requires the aircraft to be on speed at touchdown with a firm, steadily increasing brake pressure applied. The spoilers were not checked up, and the engine was not secured before leaving the runway. Had these two items been accomplished, the aircraft damage might have been eliminated or at least minimized. ◄

An Icing Nightmare

By Cdr. J.J. Miller
VXE-6

THE good news was that the deployment was over. The bad news was that I'd been assigned to the last plane to depart. On top of that, it was the "rob-bird." It beat going back on the airlift, or so I thought. I was looking forward to an uneventful Pacific crossing and an eventful reunion at home. Little did I know I was in for the nightmare of my young aviation career.

The first leg of our TransPac required a preflight tailwind component of 40 knots in order to make it without refueling at an intermediate island airfield. The weather briefer gave us an average 35-knot tailwind component over the entire leg. It would be close, but I was just the copilot on this flight and everyone knows you don't worry about gas until you make plane commander (PC). Our PC was an experienced lieutenant commander with close to 3,000 hours. It was going to be his job to sweat the fuel. After reading the discrepancy log, it became obvious to me why they called this plane the rob-bird. It was missing the auxiliary power unit, inertial navigation system, true airspeed computer, doppler, loran and the onboard computer interface. The navigator was going to have to celestially navigate across the Pacific Ocean. I wasn't worried. Copilots don't sweat navigation.

In order to arrive home at the West Coast early in the morning, we needed an evening takeoff and one of those dreadful all-night endurance contests with a dawn landing. We would get minimum crew rest that day and take off that night. Excitement and anticipation flowed freely throughout, and no one seemed to mind the idea of a night transit. The prospect of going home after six months of hard work was reason enough to sacrifice once more, especially after watching all of our shipmates depart before us. The evening preflight progressed satisfactorily, but something happened on our takeoff roll that would affect the rest of our flight. I made the takeoff from the left seat with the PC in the right. At 80 knots we made our acceleration power check, and it appeared to me that the number 3 engine was about 400 shaft horsepower (SHP) low. I heard the flight engineer say "Number 3 . . .?" and the PC say "Keep going!" I did. I was hoping it was just a bad gauge. Nothing else was said. I figured if the power on number 3 was good enough for the PC and flight engineer, it was good enough for me.

The first three hours of our flight went by uneventfully. The PC cycled out of the right seat and our nugget third pilot took over as copilot. The PC assumed his position in the horizontal on the radar cabinet directly behind my seat. Due to our degraded navigation systems, the desire to obtain a celestial fix influenced us to climb through a stratus cloud layer. This climb was a bit ahead of our max range schedule, but the PC directed, and I climbed. The aircraft entered the cloud layer and immediately began to accumulate ice on the windshield. I said "Looks like we're picking up some ice. How about we turn on engine and propeller anti-icing." The PC, sitting behind me, driven by an obvious desire to conserve fuel, said "Not just yet, besides we're too high to be getting much ice." I glanced at the OAT and it indicated minus 20° C. That meant the actual was about minus 30° C. The PC was right, we were out of the "typical" icing range, but I squirmed in my seat. Because we started the ascent early in our max range schedule, our climb rate was minimal. We remained in the cloud layer and ice continued to accumulate. I didn't like it and neither did our flight engineer. He requested permission to turn on the anti-icing but was denied by the PC. The PC then dispatched the off-duty flight engineer to inspect the engines, using the Aldis lamp. Within seconds, he returned to the flight station with eyes as big as saucers and a voice two octaves higher. He proclaimed, "Sir, there's a whole bunch of ice around those engine inlets and props!" The PC then directed the flight engineer to turn on the engine and propeller anti-icing. As the ANTI ICE lights illuminated, the number 2 rpm began to decrease. Number 2 flamed out at approximately 80 percent rpm. The PC, now standing behind me, took control of the flight station and directed feather of number 2. As number 2 feathered, decay of number 1 rpm occurred, followed by apparent flameout. He called for feather of number 1. As number 1 feathered, rpm began to decay on number 4. Passing 70 percent rpm, number 4 flamed out and number 4 was feathered.

I couldn't believe it. Surely, this was a dream and I would soon awake. Numbers 1, 2 and 4 engines were feathered, their respective emergency shutdown handles pulled. The only engine still operating was number 3. Since we were now single-generator operation and the propeller deicer was on, the electrical system automatically load monitored and cut off all interior lighting except cockpit instrumentation. The 16 non-flightcrew squadron personnel we were carrying as passengers were awakened in the now pitch black tube by the panicked voice of the third pilot announcing "Prepare to

bail out!" on the public address system. He did this, by the way, on his own without direction from anyone. The scene could only be described as mass pandemonium.

I put the number 3 throttle to max power and commenced a 500 fpm descent, holding approximately 200 knots. We were at FL270 and descending. The PC, still standing behind me, called for and performed the inflight restart checklist for engines 1, 2 and 4. They were restarted in sequence 2, 4 and 1. Much to our surprise, a normal restart was observed on all engines. We arrested our descent at FL210. It took several minutes to restore order to the back of the plane once the lights were returned. Some of our passengers were sure this was all a joke; others were convinced they were still going to die. Little was said in the flight station for the rest of the six and one-half hour flight. I know no one slept, and at the slightest hint of a cloud, the engine and propeller anti-icing was turned on. We diverted to the intermediate island airfield for fuel.

After I was able to stop my knees from knocking and restore some composure, I began to ponder what had happened. I wondered why number 3 didn't follow suit with engines 1, 2, and 4. Don't get me wrong, I was awfully glad it didn't. But surely it had iced up just as much as the other engines. We turned on its anti-icing at the same time. Suddenly it hit me. Number 3 didn't flame out because a portion of the anti-icing was on *all* the time. That's why we had the low power on number 3 during the takeoff roll. The anti-icing valve was probably failed open or partially open. What a strange turn of events. A malfunction becomes the only factor that prevented a sure disaster.

Although fiction, this article is based on an actual P-3 incident. The major events in this story did happen. — Ed.

Dressed for the Occasion

By AQC M.D. Caskey, USN
VA-27 Safety CPO

In my 17 years in the Navy, many improvements have been made in the area of protective clothing for our personnel in the aviation community. Examples are flight deck boots which provide ankle support, cranial helmets for increased head protection, goggles which are more comfortable, more durable Mk-1 life vest covers and improved jerseys for flash fire protection.

Prior to every launch you hear the air boss announce, "Pilots are manning for the XXXX launch, check goggles down, sleeves rolled down, life vests on, helmets on and buckled." A good reminder that we are ALL to be in the proper flight deck uniform and all for one reason — our own safety.

As squadron safety chief, it is my job to look for hazards to personnel in all areas, not just in my own squadron. Happy to say, the troops on the deck are good about the proper wearing of the flight deck uniform. There is, however, one constant discrepancy seen on every launch and recovery — AIRCREW PERSONNEL!

Look in the cockpit of many aircraft on the deck. What do you see? Pilots/NFOs, in the latest version of Nomex fire resistant flight suits, with sleeves rolled up to the elbow. Those dashing, skilled aviators in their multimillion dollar, fuel-laden aircraft. Our "leaders"!! Our "bosses"!! The men who will look out for OUR safety, with their sleeves rolled up and their visors up.

Many times I have signaled a pilot or NFO to roll his sleeves down, and usually they cooperate. On too many occasions, though, I have been brushed off, told to go away, that it's not my concern. IT IS and that type of reaction hurts.

Our leaders set the example for the troops. What is enforced in the trenches must also be applicable up the line.

Let's get the word out to ALL HANDS to observe ALL safety precautions, no matter what the rank/rate or occupation.

Pride, professionalism and *safety* go hand-in-hand. ◄

The Homecoming

By Lt. S.R. Wagner, USNR
HC-6

"FLIGHT quarters, flight quarters, all hands man your helo flight quarters stations. Fire party team Bravo . . . ."

Well, it's the last time I'll be hearing that for a while. I thought this day would never get here. Two more hours and it's Miller time.

Joe Rotorhead has just completed six months of fast-paced operations with the world's best nuclear Navy. His detachment has been in the spotlight the entire time, BZs out the nose, never missed a commitment, and the birds were always up. They were a cinch to get the Battle "E."

Preflight, start and engagement were all routine. After all, Joe had almost 300 hours on this cruise. This was old hat, a few runs between the ship and the beach, and he'd have one more cruise under his belt.

". . . your winds for takeoff are 40 degrees to port at 25 knots, green deck."

Okay, gauges are good, pull it into a hover, pedal turn right, panel's clear.

"On the go!"

Okay, clearing the deck. Rats! Not climbing, water's coming up fast. @#$%*! (Collective in the armpit.) Better stay in ground effect until we get a little airspeed.

"I didn't think those triwalls were that heavy."

They weren't. Joe hasn't seen Mom and the kid in six months. All he talks about is how good it's going to be to see them. That's probably what he was thinking about when he took off with that tailwind. Let's go back to the cockpit.

"Look at all the people on the beach!"

"Unidentified helo north of East Coast International, contact East Coast tower on . . ." (transmission on Air Force common).

"Joe, I've got traffic at three o'clock level, one mile and closing. Looks like he's on final."

"We better get outa here!"

Damn, I forgot we went through their control zone on the way in. It's too late to worry about now.

"Switch us to homeplate tower."

Wake up, Joe. What do you think the Det Ops Officer gave that course rule brief for? It wasn't for his health. It was for *yours*! You've been gone a long time. Homeplate is in one of the highest traffic density areas in the country. Course rules serve a purpose. *Safe traffic separation.*

". . . you're cleared to land on runway 18. Winds are 170 at six."

". . . roger."

Now let's show these squadron wienies how a fleet pilot does a running landing. Centerline. 60 knots. Ease her down.

"BRAKES!"

Too late. All four mainmounts are blown. The brakes are smoking. (So is the OLD MAN.) The duty will be fouled for quite a while. Nice way to finish a cruise, isn't it Joe?

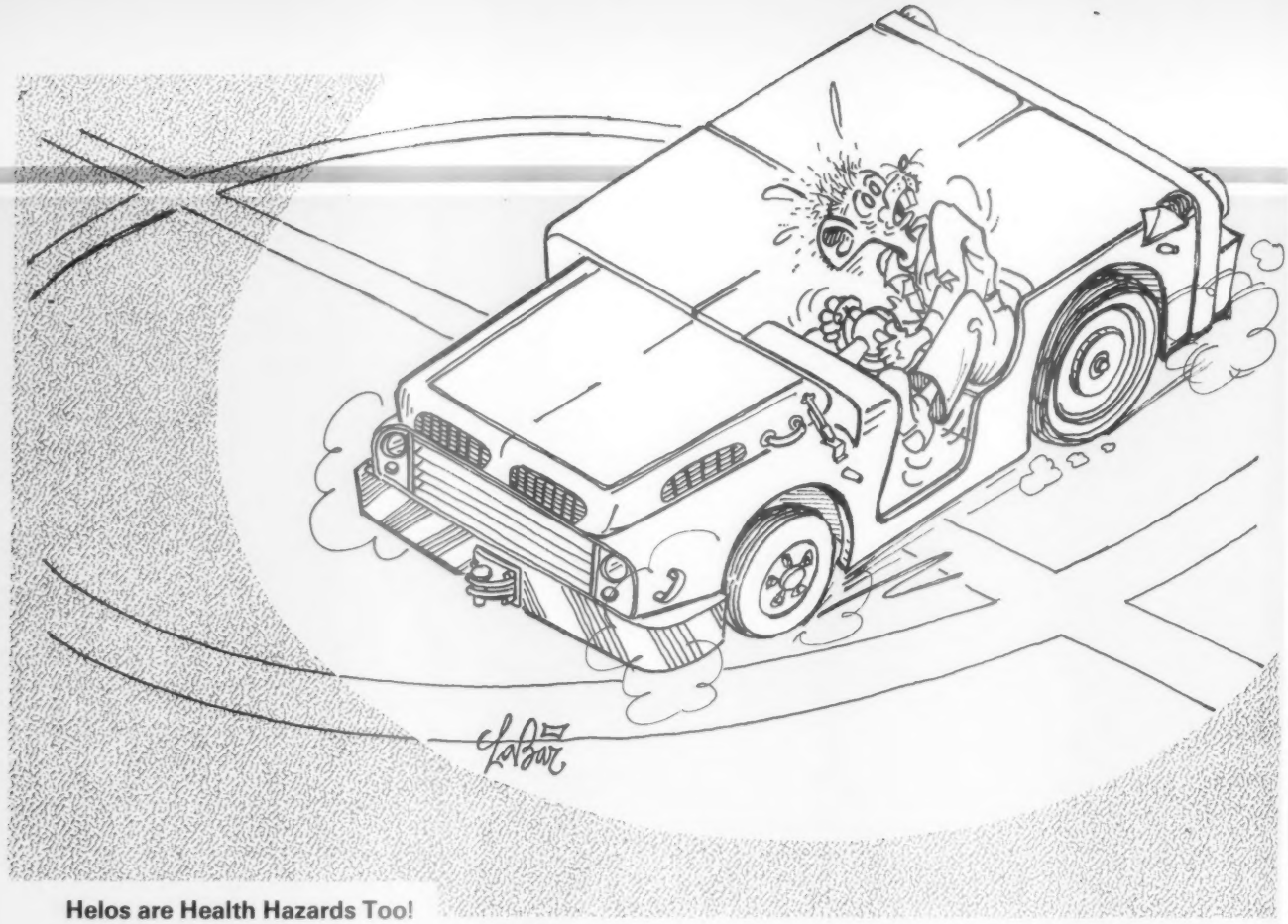
Your homecoming should be the highlight of the deployment, and it can be. Don't get complacent. There is no such thing as a routine flight. Next time you get ready to fly off, stop and ask yourself a few questions:

1) Would I have flown this aircraft two months ago?

2) Has my flight-planning and preparation for this hop been as thorough as it would be for a NATOPS/instrument check?

3) If I had my flight physical today, would I be up?

If you can answer yes to these questions, your homecoming can't help but be great. Say hi to Mom and the kid for me.



Helos are Health Hazards Too!

A few nights ago, I did something which put my life in jeopardy as well as the lives of the helo crews involved. As two helos were making their approach to land at the end of a night recovery, I drove a tractor into the landing area, causing a waveoff for both aircraft. I was trying to rush and get my job done so that I could relax a little before taps. This being my only concern, I didn't even think about the danger involved or the hazard I represented as the helos were making their approach. It's good to try to get a job completed quietly and efficiently so long as it's done safely. What I did wasn't safe at all! It was quite a shock to me when I looked up and saw that the helicopter was only 10 or 15 feet above my head. It also upset the air boss since he had to wave off the helos just as they were about to land. His job is tough enough with all the dangers present on the flight deck without me or others making it that much harder because we either fail to think or totally disregard flight deck safety once we get in a hurry to accomplish our jobs.

The flight deck is a dangerous place to work and is no place to be wandering around in a daze. You have to be thinking and aware of everything going on around you at all times. Everyone knows the dangers of propellers, jet intakes and exhausts but few people are aware of the hazards involved with helicopters. No one would be crazy enough to go running into the landing area when an F-14 or E-2 is coming in, but the same people seem to be oblivious to the danger of helos and go walking, jogging or driving a tractor around the area where a helo is getting ready to land.

The helo is one of the most unstable aircraft on deck, and it is especially critical when landing aboard ship. At night, these difficulties are multiplied tenfold. The crew's total concentration is on keeping the aircraft stable as it is landing on an area moving away at 20 knots. Their total attention is on the signals of the LSE, and in their cocked-up attitude, they cannot see what is under their nose. Should a helo crash on deck because of someone's irresponsible actions, a lot of people could get hurt or killed. Rotor blades become a hail of shrapnel, traveling across the flight deck at 150 knots or more. Inside the blades are lead weights for dynamic balance. If one of these weights gets thrown off, it can go completely through a tow tractor and kill someone standing behind that tractor. People who walk under the rotor arc as the helo is turning are also in a dangerous area, even if a crash does not occur. Anytime the rotor is being engaged or disengaged, the blades are capable of flapping as low as three feet from the deck. Since there are no three-foot sailors in the Navy, it is reasonable to assume that whoever is standing under this rotor would literally be cut in half by the blade. As you can see, the helicopter can be more hazardous than any other aircraft in the inventory. Simply because people do not realize the danger.

If you aren't needed to help recover

ANYMOUSE

a helo, stay far enough away so that you don't present a hazard. Stand clear of the rotor arc until the blades have stopped turning. If you see someone about to go into the landing area, don't hesitate to point out to him the helo approaching or the danger zone of the rotor blades. Saving a few minutes by doing something thoughtlessly isn't worth betting your life on the successful completion. Remember, helos can be hazardous to your health, too.

Helosafetymouse

The air boss involved in this mishap requested that the individual responsible for the waveoffs (an AA) submit an article concerning the safety violation involved and what should be learned from the hazard. It was printed in the CV's daily newspaper and served to educate, not only the individual concerned, but the entire crew. Score one for the air boss, the young greenshirt and safety on the flight deck . . . . — Ed.

No Action Taken

I found out through a close friend that one of his ejection seat drogue guns had been armed without the use of a torque wrench. He told me that once he had found out about it and started to dearm it, he had to use a breaker bar. Since an improper torque had been used, the cartridge had to be removed by EOD (Explosive Ordnance Disposal) personnel.

Once this maintenance error had been found, a message was initiated by the person who had found it. To this day, no message has ever been sent out, and very few people know about the incident (the XO and CO of the squadron don't even know about it).

The problem is, how is the rest of the naval aviation community going to know what happened and learn from this mistake if no one is taking any action?

It cannot be overemphasized that use of the correct torque value on any cartridge actuated device is of the utmost importance. In some instances it will cause the cartridge to swell, which could interfere with the proper operation of that component and break the chain of events required for a successful ejection. It may also lead to a dangerous maintenance operation in the removal of the 'stuck' cartridge. This maintenance error should certainly have been reported.

Bigger Is Not Always Better

ANYMOUSE attempted to make a power source for his personal portable entertainment device (PPED) and soldered six D-size alkaline dry cell batteries together with 18-gauge wire. Approximately 20 minutes after assembly was completed, one of the batteries exploded spraying his face and eyes with the alkaline contents and metallic particles. Eye goggles were not worn. The incident occurred in a squadron work center aboard a deployed carrier.

Anymouse received alkaline burns to his face and eyes with multiple superficial metallic fragments in his right eye. The initial medical diagnosis was that he might lose the vision in his right eye. Fortunately, his vision will recover. What saved his eyes was the quick reaction of his squadron mates, who immediately started rinsing his eyes with water, thus diluting and reducing the burning capability of the alkaline compounds.

Most small PPEDs are powered by AA-size batteries which are quickly consumed. The popularity of PPEDs depletes supplies of AA batteries during long deployments for naval units. Thus, it becomes advantageous for sailors to juryrig power sources using available D-size batteries and at the same time extend power source life.

Common sense will stop most people from applying a soldering iron directly to a battery. However, the need for a long-life power source, coupled with seeing this practice being done successfully by shipmates, negates whatever knowledge of the potential hazard may have existed. Anyone heating up a battery to the point that it explodes is asking to be a fatal or permanently disabled statistic.

BOARDING

in the proper

IT'S a dark rainy night. As your aircraft hits the three-quarter mile point, you call the ball and hear that reassuring LSO reply "Roger, ball." This call is soon followed by, "you're starting to settle; you're low, power, power, easy with it, *bolter, bolter!"* Just another bolter, you say? If they didn't expect aircraft to bolter, they wouldn't have built the angled deck, you say? *Wrong attitude,* I say, and I'm sure I would be backed up by any carrier commanding officer. To put it plain and simple, you have just failed. In doing so, you have reduced the margin of safety and caused a lot of extra work for the carrier recovery team.

In our business of tactical aviation, we pride ourselves not only as good attack pilots, fighter pilots or ASW pilots but also as good carrier aviators. By definition a good carrier aviator is one who makes his ramp time, looks sharp in formation around the ship and flies an exacting landing pattern with the proper groove length and aircraft interval. But the greatest measure is consistent safe approaches that result in an arrested landing. Boarding rate is *critical.*

Carrier operations are precision evolutions which revolve around minimum recovery time. Every bolter or waveoff eats into that precious time specifically alloted for a safe respot and launch. Any extra time "into the wind" hinders the carrier's maneuverability, making it a predictable target

RATE

perspective

By Cdr. Joseph E. Hart
VA-27

for any enemy platform. If the carrier is recovering aircraft in a limited operating area, a long drawn out recovery cannot be tolerated. Successive bolters result in pilot fatigue, making it harder and harder to fly that precise approach. Why not do it right the first time? Bolters result in excessive fuel consumption and aircraft wear and tear. Many of our carrier operations take place in the "blue water" environment where an excessive bolter rate requires refueling that reduces the precious airborne fuel needed for a real emergency. The inability to get aboard can eventually result in a *bingo*, which by its very nature is a mishap waiting to happen.

Now I'm sure you will agree that a consistent, good boarding rate is necessary for smooth safe carrier operations, and then you say, "But no one wants to bolter. Every pilot is trying to fly that OK pass on each approach." Well listen hard, especially all you training command and RAG students. Good solid ball performance begins right now! Carrier pilots are a special breed. Every landing you execute must be a precision landing flown from a precision pattern. Habit pattern, which involves a lot of self-criticism and hard work, must be established. FMLP approaches on all landings will have you hitting all the checkpoints consistently on every approach. Demand perfection. If the pattern altitude is 600 feet AGL, then 620 feet *is not acceptable.* If you're showing a donut and fast chevron then you're *not* on speed — you're fast. Discipline, discipline, discipline on every landing! A good precise pattern will result in that good start which is absolutely essential for a good pass. From here on in habit pattern, scan and intense concentration are required. Without getting into too much technique some basic principals need to be stressed here.

Never accept a low ball. The sunset ticket to a bolter, early wire or waveoff can be bought by nursing the low ball. This low situation forces the LSO to give "power" calls which frequently result in the "over the top" bolter. On a low, flat glide path your vertical deviation will result in a greater touchdown error distance than the same deviation on the steeper, normal glide slope. Thus your chances for either an early wire or bolter are increased.

Work all the way to touchdown. Never give up on a pass. Concentration that results in a consistent series of small corrections for small deviation is required. Don't hesitate to reduce power in close or at the ramp if the situation requires it. But then be ready for that countercorrection. Never make a big play in close. If you are outside the window where an acceptable correction can be made, the LSO should wave you off.

Don't spot the deck. On every pass you should be able to tell exactly where the ball was when you touched down. A deck spotter will look ahead in the last few seconds and land the aircraft. If his perception is wrong, and it generally is, he will ease the nose up and bolter or lower it and catch that early wire.

Listen to the LSO. He is well-trained and can spot a trend sooner than the pilot. This is especially true at night when there are no visual cues.

In conclusion let me stress that I do not want you to confuse the term "get aboard" with "get aboarditis." The last thing I am advocating is the "Any pass is a good pass as long as you get aboard" philosophy. That line of thought leads to ramp strikes and involuntary designator changes. My point is to make you realize that bolters are not acceptable and that your carrier approach didn't start at your three-quarter mile ball call. It began long before as you developed your habit patterns. Remember it's never too late to start. Fly the ball with precision and discipline and get aboard on the first pass!

"Safety? Toothache? Bull! If I ever catch you again not wearing your wedding ring, you'll have more than a toothache — you philanderer!"

Is it safe?

By Lt. R.C. Mahon
VF-21

"Is it safe?" Whenever I hear that question, I get a sharp pain in my tooth. This started right after I saw the movie Marathon Man. Sir Lawrence Olivier plays an ex-Nazi dentist infamous for using his medical skills as a means of torture. The hero, played by Dustin Hoffman, is strapped into a chair and asked repeatedly, "Is it safe?" Hoffman doesn't know the answer, but that doesn't save him from the drill.

I got up this morning and glanced at the EEBD (emergency escape breathing device) next to my rack. The seal is good and the paper still shows blue. It's safe. I can get to it in

two seconds and have it on in a snap. In the dark? Well . . . (there's that sharp pain). Maybe I should try this along with the blindfold escape drill. I know I can escape blindfolded, at least two routes. But I didn't put the hood on as part of the drill. This would be a good time to let Safety know we need more EEBDs available for drills.

Let's see, where did I stuff those shower shoes? I wouldn't go for a shower without them. The deck gets slippery, especially in the shower stalls. It's not as bad as it used to be now that the First Lieutenant has made sure the deck drains are cleaned daily and the weekly PMS is completed. I never did like standing in three inches of soapy water, balancing on one foot while "skating" from one corner of the stall to the other.

On the subject of footwear, I wonder if any of my people still have those "Gorilla Boots." They sure had nice stitching, but the soles didn't have any traction, and they wore out before they got broken in.

Of course the laundry is slow to return my uniforms, and the only clean one I have left is one of those hand-tailored jobs I bought fresh out of AOCS. (My tooth begins to hurt). Is it safe? They're safe for Happy Hour on Friday at the O'Club. That must be where I dropped the cigarette in my lap that created the hole I'm looking at. Looks like the material just melted. Good thing I had that pitcher of beer handy. Perhaps I'll wear those wash-khakis that I've been "saving" in the bottom of my cruise box.

One last check for anything else I need. No FOD hanging off of or out of my pockets. Took those rings off a while back. I kept seeing that picture of the guy that slipped off a ladder and almost severed his ring finger. Those pictures have been up since *last* cruise, but I continue to see rings on fingers. "Hey, sailor, I see you are wearing a ring on your finger, and it makes my tooth hurt."

"Well, sir, you should see the dentist. I hear he's real good. . . ."

Sauntering down the passageway, I see all those battle lanterns. Are they safe? Let's check a few along the way, especially the one just outside the room. They work. Good!

Wonder what's for breakfast? I'll take the hangar bay, the secure route. Any way to avoid knee-knockers is a good way, I always say. I see the DCPO (damage control petty officer) has done a good job on this ladder. It feels solid. The steps are clean and the handrail is secure. It's safe.

Ah, the hangar bay. I wander past the jets. There's 211 getting some corrosion work accomplished. "Hey, you guys spelled my name wrong. And you know you should have a hard hat on when you're working up there."

"Yes sir."

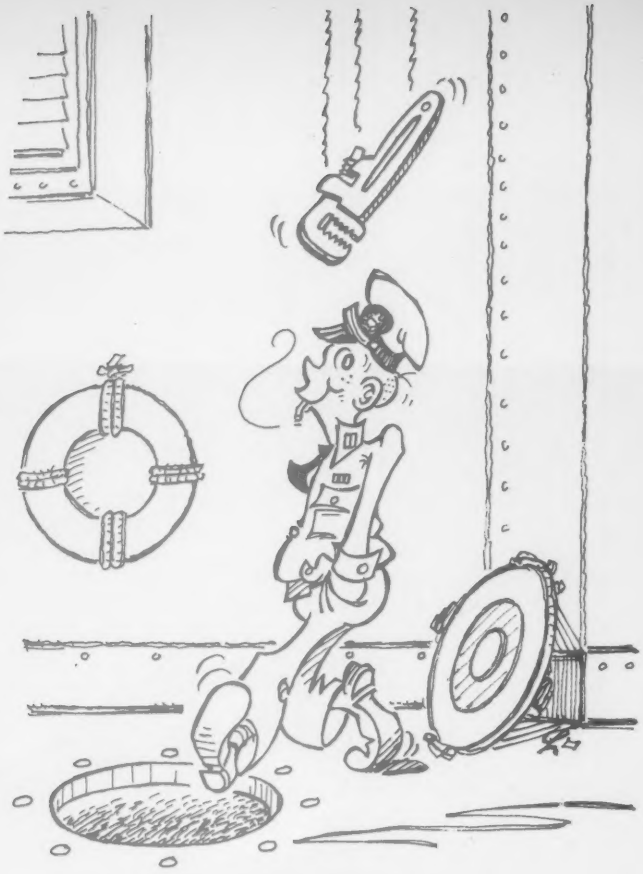
"Smitty, who was that officer?"

"Don't know. I think he was looking for Dental, something about a toothache."

Now here's the real test. "Is it safe?" The cook gives me a quizzical look and scratches behind his ear with the spatula.

"Is what safe, sir?"

"Never mind. I only want toast and coffee."



Well, today ought to be a safe day —
I got the duty.

Well today ought to be a safe day — I got the duty. I can use a rest after yesterday. On my way to find the aerojet, that ache in the back of my mouth returned. I didn't see why, though. Lots of people up there. The helo was turning. No matter where I stood on deck, the helo blades were *always* right at eye level. That must have been the cause of the ache, I thought. Then somebody jerked me to a stop as I was walking along, looking at the helo over my shoulder. OOPS! The ache became a sharp pain when I realized I was heading straight for the intake of an A-7 that was turning up for the next launch. I almost took that long trip down the short tunnel. That wasn't safe.

That was only the beginning of a long day of sharp pains and dull aches. But today will be a cinch. Just make sure the CO and XO get their scheduled traps, maybe even launch one of their spares. As long as I don't forget to pick up the 8 o'clock announcements, I'll get back to the rack without a scratch.

"Hi Steve. Thanks for picking up the movie for me. What'd you get?"

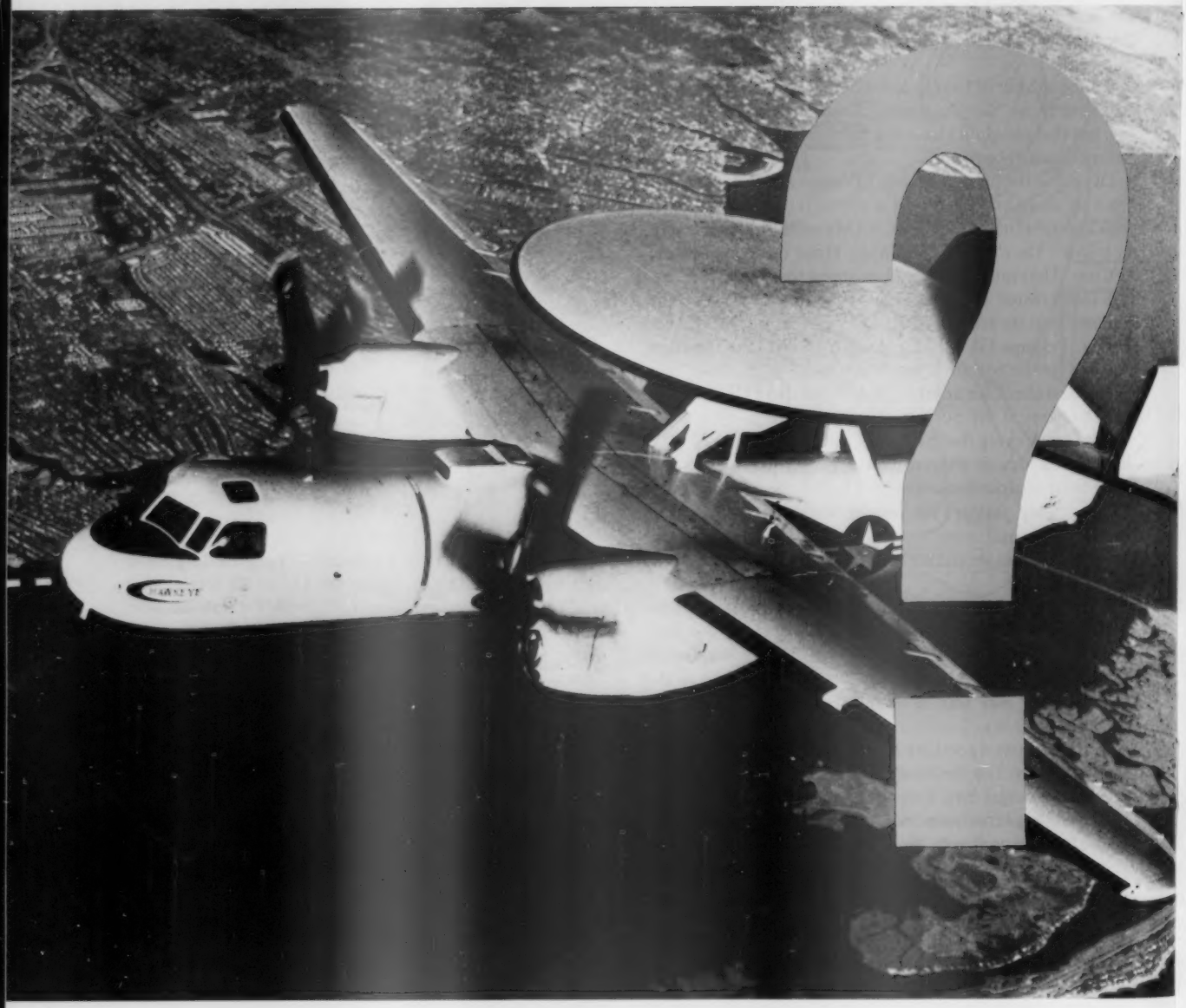
"Mary Poppins."

"Ouch!! Hello, Dental? I have an emergency . . . ." ◄

Probable Cause

A Command's Response

By Lcdr. Jim Reaghard
VAW-116



"STARBOARD engine flamed out during night CV touch-and-go landing." "Both engines flamed out on CV arrested landing." These are two common statements which appeared in numerous Aviation Hazard reports initiated by E-2 squadrons during the past decade. Probable cause in a majority of these same reports has been listed as "Undetermined."

In the summer of 1975, the Hamilton Standard propeller was introduced into the E-2/C-2 community. With it came a myriad of NATOPS procedural changes and much speculation as to whether the propeller was better than the old one built by Aeroproducts. The new replacement was to alleviate losses of aircraft and to decrease the amount of maintenance required on the old prop.

While evaluating the new system, pilots discovered that with rapid power lever movement, the engine responded quite differently than previously experienced. The RPM tended to overshoot and undershoot to greater degrees. As a result, pilot technique during the critical phases of takeoff and landing had to be altered. No longer could a pilot break at 250 KIAS, rapidly retarding the power levers to the FLIGHT IDLE position. When given a close-in waveoff, it was necessary to smoothly advance the power levers, vice adding instantaneous power. Through proper training and flight demonstrations, the new techniques were imbedded in the corporate memory of the E-2/C-2 pilot. But a new problem surfaced; it has been referred to as bogdown, RPM decay, engine run-down and/or flameout.

This is not to say that circumstances of bogdown or flameout are identical, nor are they coincident with the installation of the Hamilton Standard propeller. The limited number of Safety Center unsatisfactory incident reports available prior to 1975 indicate that the problem had occurred previously. One major difference which has evolved, however, is an attitude change as to what causes bogdown or RPM decay.

In a short span of four years (1974-1978) there were a total of 24 engine flameout incidents reported. Of these, four were attributed to poor engine performance, one to an electrical malfunction and five blamed on environmental conditions (gas ingestion). The remaining 14 incidents were documented as "undetermined: could not duplicate." After extensive engine efficiency, propeller and engine system component checks, the incident aircraft were placed back into service, usually with no further problems and usually with no maintenance required. During this same time, contributing factors of "rapid power lever movement" or "pilot technique" began appearing in incident reports. Why? Pilot technique had never been considered a factor with the old prop. Thus began the new "mind set" in the E-2/C-2 community with the incorporation of the Hamilton Standard propeller. NATOPS changes never mentioned precisely what could happen should the power levers be moved rapidly. Yet, demonstrations by Grumman test pilots and the E-2/C-2 model managers clearly showed that engine RPM would overshoot/undershoot drastically should the pilot not be smooth with the power levers. Conclusion — if the engine checks OK, and no probable cause can be determined, then perhaps pilot technique is a prime factor in the RPM decay problem.

Further investigation into other communities operating the T-56 engine and Hamilton Standard propeller system (namely P-3 and C-130) found that they also had experienced numerous bogdowns. The majority of those incidents had occurred in the high density altitude areas of Hawaii, Guam, Philippines and Okinawa. E-2s and C-2s had operated safely in that environment for years. With the mobilization of forces into the Indian Ocean a new phenomenon was encountered. Not only was the atmosphere hot and humid, it was also dusty and dirty. Incidents of bogdown became more frequent and usually occurred during the critical phases of flight. Responding to these events, local engine wash cycle of 28 days, vice the requirement of 56 days, were instituted. Engine efficiency beyond 28 days was found unacceptable due to the sand and dirt buildup in the compressor section. Coupled with the heat, humidity and salt spray during periods of 100 plus days at sea, this response seemed only reasonable. A change to the MRCs was recommended and ultimately approved. In 1980, during an eight-month deployment to the Western Pacific and Indian Ocean, one squadron experienced no fewer than four bogdowns (three single-engine and one double-engine

failure). Ingestion of hot exhaust was **not** a factor in any incident. Probable causes varied from: "defective fuel nozzles," to "lean fuel control," to "undetermined." Pilot technique was listed as a factor in the dual-engine flameout. Just months after these incidents, a deployed West Coast sister squadron experienced numerous flameouts on two specific engines. Subsequent to each occurrence different components were changed, and the maintenance low/high power turns were successful. After being placed back into service and after a few flights the engines would again flame out. Eventually, after exhaustive checks and without probable cause, both engines were changed. Although several causes for each incident were listed, the ultimate answers were "undetermined."

In June 1981, it was suggested that a T-56 user/vendor conference be held to research issues and propose solutions. Agenda items were solicited and VAW-116 responded positively with several suggestions. In the interim, the squadron was transitioning to the E-2C ARPS aircraft and was receiving factory aircraft at the rate of one every two months. Then, in August 1981, one of the new aircraft engines flamed out in the break at an outlying CONUS air station. I say "new" because the engine had less than 130 hours of total service operation. Probable cause? "Undetermined."

What happened next may have shocked a lot of people, but is also received rapid response. After the required FOD inspection and efficiency checks, the aircraft was returned to home base. Exhaustive troubleshooting could find no problem with the engine. The squadron CO recommended that the aircraft be restricted from further flights until an investigation by the major contractors (Allison and Hamilton Standard) and NAVAIRSYSCOM was completed. This unprecedented decision received full support of the wing and type commanders. Due to the potential hazard, a risk assessment code of "1A" was assigned by COMNAVAIRPAC.

Three weeks later the investigation convened. A plan of attack was devised whereby all systems would be isolated and checked. First came the fuel system. After a complete check of the engine and airframe fuel system revealed no discrepancies, the fuel control was changed. The aircraft was placed back in service. The same pilot flew the same approach with as many factors, e.g., weather, temperature, airspeed and technique as possible common to the original flight. This time, however, instead of a left hand break, a right hand break was initiated. The same RPM decay occurred on the same engine.

Next came a change in the propeller valve housing. This required a postmaintenance checkflight (PMCF), which was successful. Upon return to homebase and when entering the break, a different pilot encountered the same RPM decay. However, with the addition of power, the engine returned to 100 percent RPM. It was determined that the propeller had pitchlocked.

Further testing was not required and the pitchlock regulator was changed. Subsequent flight evaluation demonstrated that the bogdown could not be reproduced. The aircraft was placed back into service and engineering investigations were initiated on all components which had been removed and replaced.

While a final solution to the T-56 bogdown problem is still pending, the following results were found during the investigation:

1. During power lever movement (whether rapid or slow) the propeller RPM does in fact overshoot during retard and undershoot when advanced. The use of mechanical governing lessened the degree to which this overshoot/undershoot occurred. An interim measure of using mechanical governing during the break evolution was instituted as SOP for all E-2/C-2 squadrons.

2. Engineering investigations on the fuel control and valve housing revealed no discrepancies. However, the pitchlock regulator was found to be incorrectly set at 102 percent RPM instead of the specified 103-103.5 percent. Further investigation on other pitchlock regulators installed in other engines revealed that many were set below the specified parameters. A high-speed break, in which the power lever is reduced to FLIGHT IDLE, may result in RPM overshoots of up to 102.9 percent. The result could be a pitchlocked propeller if the regulator is set below 103 percent. Then, airspeed decreases, RPM decreases and ultimately flameout occurs. Many pitchlock regulators in the fleet were subsequently reset.

As of this writing, VAW-116 had just completed a six and one-half month deployment to the Western Pacific and Indian Ocean. With the new pitchlock regulators installed, using mechanical governing as required, and continuing with aggressive maintenance practices, the squadron did not experience one incident of bogdown. Pilot technique has not been altered and engine response during touch-and-go landings and waveoffs has been excellent.

Although the final solution to the T-56 bogdown problem may not yet be known, the command response to this hazard proved to be beneficial to the E-2/C-2 community. If the squadron had continued operating under the guise of "probable cause: undetermined" or "pilot technique" and not taken action, it is not known how many incidents would have occurred during its latest cruise. One can only speculate here. But the command position to find an answer brought about a timely response, and this response did discover engineering problems which, whether or not combined with other factors, may be the answer to the question of "probable cause." ◄

"Plane in the water, plane in the water!"

By AT3 John Hanigan
VAQ-135

Q. What is your first thought?

A. Well, first I pray it wasn't a Prowler which met a watery grave.

My second thought is to wonder if I could sneak a look from the catwalk. There is nothing wrong with the first thought, but the latter has several things wrong with it. First is the fact that hundreds of people are thinking about running to the catwalk to catch a peek. Next, clogging the passageways and catwalks prevents other personnel involved in the rescue from expeditiously doing their job, not to mention the fact that the ship will still be in the recovery mode.

Q. How often have you been told to stay off the flight deck unless you belong there? How many times have you all read safety tips on flight deck safety in the POD?

A. Plenty of times. But, obviously not enough times to make all of us aware that during flight operations the flight deck is "off limits" to unauthorized personnel. This doesn't include the fact that plane in the water, emergency recovery, etc. problems make it a far more dangerous environment.

On 11 February during the second event, we had an aircraft in the water aft of the ship. This mishap occurred while the ship was in the recovery mode. Before the air boss even called "Plane in the water," gawkers were crowding into the catwalks and even running into the *landing* zone to catch a look at the disappearing Corsair. When the air boss finally called "Clear the flight deck," chiefs and safety petty officers had to actually scream and push people toward a flight deck exit. Naturally the catwalks were filled with gawkers and no one could leave the flight deck. What if there had been an accident or fire at that time? The results could have been even more catastrophic.

I realize a lot of what I have written is speculation and "what ifs," but I'm glad I can write this article as fiction instead of using statistics from someone's negligence. Stay off the roof if you don't belong there and aid a workingman's efforts for the safety of all of us. ◄

Maj. Glenn Stickel

Maj. Dennis Staver

Maj. Dennis Staver
Maj. Glenn Stickel
MAG-46

A SECTION of A-4 Skyhawk was performing 10-degree bomb deliveries. Maj. Glenn Stickel was pulling off target following his fifth bomb run when he felt an "explosion" and severe airframe vibrations. He retarded the throttle and prepared for immediate ejection, fearing catastrophic engine failure. Upon noting that he still had a controllable aircraft, he advanced power, determining that the engine response was normal. He noticed that he had two unsafe main landing gear, and the nose landing gear indicated up and locked. The landing gear handle was physically verified up and locked, but the red light in the handle also warned of unsafe gear positioning. After climbing and analyzing his situation, he was joined by the flight lead Maj. Dennis Staver. Staver reported that both main wheels were extended but did not appear locked; the nose gear was up and the door closed. Additionally, there was visible damage around the mounting area of the main landing gear trunnions and large amounts of hydraulic fluid.

Stickel began reviewing his procedures mentally while Staver took out his NATOPS Pocket Checklist. Staver critiqued the procedures for utility hydraulic failure, emergency landing gear extension and structural damage with Stickel, and then they consulted the gear malfunction landing guide. Both of the main landing gear were still indicating unsafe and were visually checked as unsafe. Staver and Stickel decided against the increased-G method to get a positive locked indication on the main gear because of possible airframe damage caused by the high-speed extension of the gear. Stickel increased his airspeed until the main gear were locked and overcenter as verified by Staver in the other aircraft. The left main still indicated unsafe in the cockpit but was visually confirmed to be locked, so Stickel extended the nose landing gear door with the emergency landing gear extension handle. All three landing gear were then confirmed down and locked by Staver although the left main still indicated unsafe in the cockpit.

Stickel then performed a slow flight controllability check while Staver read from his pocket checklist the items that would be lost with a utility hydraulic failure. An emergency was declared to Yuma tower with a request for an LSO and a fly-in arrested landing. An LSO was not available, so Stickel and Staver again reviewed their NATOPS procedures, including type of approach to be flown and effects of utility hydraulic failure on configuration.

Stickel made a perfect pass and arrestment. The aircraft was pinned and shut down in the arresting gear without further incident.

The close coordination and teamwork displayed by this very professional section quickly reduced a confusing and dangerous situation to a controllable emergency condition. The proper application of NATOPS procedures and use of checklists in conjunction with the calm leadership of the section leader provided a successful recovery, saving the

BRAVO ZULU

aircraft and precluding serious injuries. Staver and Stickel clearly demonstrated that crew coordination need not be only the province of multipiloted aircraft, but is also essential in multiple single piloted aircraft flights.

Lcdr. Don Santapaola
Lt. Mike McGraw
VF-43

"SANTA, we've got a problem!" Great! Just what a RIO loves to hear from his pilot. "Take the controls, I've dislocated my left shoulder and can't move my left arm." This was the situation confronting the crew of a TA-4J on a strike opposition mission during an air wing deployment to NAS Fallon, Nevada. The pilot, Lt. Mike McGraw and his RIO, Lcdr. Don Santapaola, were 15 minutes from home plate and in a dangerous predicament.

After a normal brief, start and departure as No. 3 of a three-plane opposition force, McGraw and Santapaola were getting ready for a morning's work as "bad guys." While passing miscellaneous items to the aft cockpit, the pilot hyperextended his left arm resulting in its dislocation, rendering it completely immobile. Santapaola took control of the aircraft while McGraw used his right hand to retrieve and position his left arm back in the front cockpit. Detaching from the flight, the crew headed home, informed base of the situation, requested medical assistance upon arrival and priority handling for a straight-in landing. Having taken care of the admin portions of the situation, they got down to the heart of the matter — Santapaola was going to have to *land the aircraft*. McGraw's right hand was supporting his injured left arm and shoulder and was useful for stick control for very short periods of time — in *extremis* only.

The straight-in approach procedures were reviewed, possible contingencies discussed and a game plan formulated. To avoid confusion, Santapaola would retain positive control of the aircraft, and McGraw would supply physical inputs to the stick in *extremis* only. Technique, procedural and progress information would be continuously passed back and forth, and an uncomfortable or unsafe situation would terminate the approach. There was time and fuel enough to get the job done right.

The cool and skillful execution of the well-prepared game plan resulted in completion of a safe landing at an airfield with 4,000 feet of elevation and gusting crosswinds. The crew's calm analysis, coordination and judgment demonstrated aviation professionalism at its finest. Santapaola's performance under pressure was a flawless testimony for a RIO to maintain a thorough, working knowledge of procedures and limits, both NATOPS and personal.

Lcdr. Don Santapaola (left), Lt. Mike McGraw (right)

It'll Make It

By Lcdr. D. Pech
HC-3

"WE'VE got a bird down in Charleston for a bad rotor blade and need a checkflight crew to go get it."

I'd heard those words before and figured this wouldn't be the last time. Besides, it would be a nice break in the routine and a chance to collect a little per diem. I mean, what could be more simple? Hang a new blade, do a quick rotor track, then on to the destination NARF. I'd be home by the weekend. What could be better? As it turned out, an awful lot could have been better, starting with my attitude.

Assembling the maintenance and flightcrews, gathering the parts and support equipment and getting to Charleston all went deceptively well. We took a squadron aircraft and crew, slid in a rotor blade, boarded the maintenance team and eight hours later we were on deck surveying the problem.

The aircraft which brought us to Charleston was scheduled to return with the retrograde parts and the maintenance personnel. The flightcrew wanted to leave early the next morning which meant we had to complete the maintenance and checkflight the day we arrived. After an eight-hour flight in the back of an H-46, we were all tired. But there were still a few hours of daylight remaining and what the heck, it would only be a 10-minute flight.

Of course, first the rotor blade had to be changed and to do that the proper socket for the blade cuff bolt was necessary. The maintenance team had left it back at the squadron. We lost nearly an hour borrowing a socket from a local activity, but if things ran smoothly, we could still get out before sunset.

Only 20 minutes remained until sundown. The rotor blade was on; daily and turnaround inspections completed, I filed while my copilot finished the preflight and we were off. I sure hoped the track didn't need an adjustment or we'd be out of business for the night.

"Track looks good," the crewman reported from the back. Sensing a vertical vibration in the airframe, I asked the crewman to check it again, paying particular attention to the forward rotor head.

"Track is good," came the reply in a somewhat wavering voice. Well, if the crewman said it was good, it must be okay; I've flown worse feeling aircraft. Besides, the flight to NARF is only two hours long, and it's happy hour.

"It'll make it," I said to myself.

After a night on the town, everyone was up early for the brief. The aircraft commander, who was returning to home plate, and I checked weather after our individual crew briefs

and noted a 1,500-foot ceiling.

"Okay, let's go . . . Engine fire handles — IN . . . Battery — ON."

"Who left the battery on last night?"

Without a good battery in our H-46, the auxiliary power turbine (APU) couldn't be energized and the aircraft wasn't going anywhere, unless an external power cart could be located. It wasn't likely we'd find a new battery on an Air Force base and obtaining a power cart meant more delay. Of course! We could play musical battery with the other aircraft. We could start by using its battery, get our APU on line, engines started and rotors engaged then return the battery. So what if our battery was dead and we couldn't start our APU in flight? We wouldn't shut down until we got to NARF anyway.

"It'll make it," I thought.

Starting No. 2 I noticed a little smoke from the exhaust area. Consulting with the functional checkflight qualified aircrewman/jet mechanic from the other aircrew (waiting for its battery to head home), he reported that the No. 5 bearing carbon seal may be starting to go. I pondered the ambiguity of his statement. If you thought about it, the seal was starting to go from its initial installation, so I asked for his recommendation.

"It'll make it," he said.

The climb to 3,000 feet on top was no problem. The overcast at 1,500 feet was only a few hundred feet thick, vertical beat was bearable. It was Friday and I had been told that a T-39 would be waiting at my destination to take us home. I should have been buoyant in my natural environment, but I found myself uneasy, scanning the gauges more than usual.

Twenty-five minutes into the flight, the No. 2 oil pressure started to fall. I reported the discrepancy to approach control and requested an immediate descent and vectors to the nearest airfield.

"Cleared for an immediate descent to 1,100 feet, turn right to one zero zero for an airfield six miles ahead," answered the controller.

Single-engine procedures were completed in the descending turn, except one: APU start and select prior to landing.

Breaking out under the overcast slowed my heartbeat considerably from what it had been entering IMC without an APU electrical backup. I told approach I was VFR, and the controller updated my airfield location to 12 o'clock, three miles.

With the runway in sight at three miles, I continued my straight-in approach. Passing 1,000 feet, approach control broke my concentration with instructions to maintain 1,000 feet and remain on the airway!! Reconsidering the response I had initially intended to give the controller, I crisply reinformed him that I was losing an engine and that my intentions were to land on the runway I had in sight.

Thankfully, my landing was uneventful despite an inability to communicate with the local VHF tower. On deck, with plenty of time to think about the entire incident, I was glad the occurrence developed into nothing more than a very pointed learning experience.

Some of the "hard knocks" I tallied in this course of instruction were:

— Self-imposed deadlines should be used only when a valid reason exists. When there is no real need to press on, don't do it.

— If something doesn't feel right, it probably isn't.

— Ensure approach control understands the nature and severity of an inflight problem and that an emergency is being declared.

— Whenever hearing the phrase, "It'll make it," ask yourself two questions: "What if it doesn't?" and "Is it worth the risk?" ◄

HARD KNOCKS

By Lt. S.D. Hissem
VF-21

WHEN my pilot and I settled into our readyroom chairs to listen to the brief for that night's hop, we had little idea that we would not be back for our standard midrats and card game. Instead, we would have been through a hard school and learned lessons which would stay with us for many years to come.

We had been operating off Westpac Divert for some time and had become comfortable with the area. There was no moon but the weather that night was clear with a well defined horizon. The mission was a routine combat air patrol that went as briefed, and we marshaled with only a little trepidation about that night's pass.

Soon, however, it became apparent that this was not going to be an easy night. The first pass was a technique waveoff which was followed by a long bolter. On our trick or treat pass we were again waved off, and we called that we were "bingo."

We turned to our divert heading, accelerated to climb airspeed and began our climb when departure advised us that a tanker was available.

We were soon to learn about hard knocks.

Despite our previous problems, we wanted to come back and get aboard. This time we *knew* we could do it. We knew we could prove ourselves, and this, more than anything else,

forced the decision for us.

I told departure, hedging my bets, that we would continue on our bingo heading but that we would hold our altitude to let the tanker catch up. In a climb, he would have had no chance.

With the lights of the coast glowing on our nose, we continued on. After a time I spotted the tanker joining on our left side.

My pilot remained unsure of the tanker's position. I tried to keep him advised by describing the tanker's joinup and crossunder. As the tanker slid in, I advised him that the tanker was "in close, nice and tight. He's real close, he's . . ." and I realized in that awful second that it was all wrong as the tanker bore in. "Left, left, come left!" I called as I instinctively ducked my head in the cockpit. Too late for action, the tanker struck us and, as I looked up, fell away into the night. Later we learned that they had called for the lead and then assumed they had it even though we had not replied. We had, in fact, heard nothing.

We had been scared, but we were okay. The aircraft was still flying, still pointed towards our divert field. When we heard that the tanker was okay and heading back to the ship, we knew that we had been lucky.

But the night wasn't over and neither were the hard knocks.

We called bingo again and this time meant it as we followed all the procedures and climbed to altitude. Calling divert approach, we advised them that we were emergency fuel and that we had had a midair, though there was no apparent damage.

We earned immediate respect with that call. After clarifying several more times that we were okay, we got vectors to the field.

The divert asked if we wanted to make an approach to the off duty runway, which was more direct. They also asked if we needed an arrestment. Our fuel looked good so we declined the downwind landing and decided that an arrestment was not indicated.

That was true, but that was not why we made the decision. At that time a field arrest required a hook point change that would have kept us on deck and delayed our return to the ship. Once again we felt that we had to get back to the ship as quickly as possible, but this time in order to explain to the skipper what had really happened that night. We "knew" we were being accused of hitting the tanker, rather than the other way around, and before things got blown out of proportion we wanted to tell our story.

We vectored towards final, lowered the gear and flaps and checked controllability, which was normal. On landing we deployed the chute and began a standard rollout. Just as we passed over the approach and arresting gear, the aircraft began a left drift.

I'm not sure why I knew that we had blown a tire; I certainly hadn't heard anything. Perhaps being keyed up, I sensed things more closely, or more likely I had become fatalistic. I know I wondered to myself "What else could possibly go wrong? Whatever the case, the immediate action steps come to mind and I called for nosegear steering.

Looking back, there are many things I might have done differently. Had there been time, I might have told the pilot to be sure and center the rudder pedals before selecting nosegear steering, but there really was no time. I might have remained silent and let my pilot work out things for himself. My call may have interrupted him and caused him to skip over that vital step, but I know I could not have remained silent on the hope that the "other guy" would take care of everything.

It remains that upon selecting NGS with the right rudder pedal fully depressed, we swung wildly to the right and ended up staring at the runway down our left shoulders doing over 100 knots.

The aircraft swung back and forth several times as the pilot fought to gain control and get the aircraft at least heading in the same direction that the gear was pointed. She finally steadied out but 30 degrees off runway heading. As we approached the edge of the runway, I told my pilot that I was staying with the aircraft. I thought briefly about the advantages of securing the engines to save a possible FOD, but more important to me was keeping electrical power so I could communicate with my pilot in case anything *else* happened.

The aircraft rode well through the grass and quickly came to rest. We told the tower where we were, then shut down the engines and egressed.

Now it was over. We wouldn't return to the ship that night or for many more to come.

We were unhurt and the aircraft was only slightly damaged. All four tires were shredded, but, despite going off the runway, we had damaged only one brake line. In the midair, we discovered the tanker had hit our starboard wing pylon which had jettisoned upon impact and fallen into the sea. The tanker itself had been unhurt as the pylon tumbled over its left wing.

We understood now that we had actually been very lucky. All that remained was to try to learn something of value from that night.

Lessons Learned:

- Don't look back. When you're bingo, you're bingo. You're an emergency aircraft, and you need to do everything right if you expect it to make it. *Never doubt that a bingo is an emergency.*
- Don't assume. Lead changes are some of the most potentially dangerous maneuvers in the air, especially at night. Don't take them for granted.
- Set your priorities. During an emergency, even when it's under control, you haven't completed all the action steps until the plane is tied down. Worry about explanations later.
- Learn from your mistakes. The school of hard knocks is the most painful one in which to learn, but the one which leaves the most indelible imprint.
- And, oh yeah, expect the unexpected. Just when things are going wrong, they could get worse. ◄

IP Follies

or How to Read a Student's Mind

By Ltjg. Niel Golightly
VT-25

THIS will be a round-robin instrument hop. You introduce yourself to the student (a pretty fair stick, other instructors have said), and he produces jet logs which are a marvel of fine-printed "gouge," including METRO frequencies in the adjoining state and a Morse code index to no less than 21 local TACAN stations. He's got approach plates, with tabbed page markers, as well as a chart with highlighted jet routes and a virtual reprint of the flight training instruction in the margins. His training jacket indicates one or two problems with GCAs but nothing gross. He's obviously ready for this hop, you decide, and if you hustle through the brief you can preflight before darkness sets in.

You're a little uncomfortable during the takeoff. You're tired, and you feel like you're a second or two behind the airplane. But the student, after all, has made it all the way to Advanced and between the two of you, anything that goes wrong should be caught in time.

You fly to nearby NAS Brand X, and the student shoots a passable TACAN approach, although you have to caution him against getting underpowered at the final approach fix. Back at home plate you enter the GCA box pattern. He flies two decent PARs and a partial panel ASR. This last one is a simulated emergency fuel PAR to a full stop, and with a little luck you'll be home in time for Magnum P.I. He's getting rushed on this one and at three miles he sets up an excessive sink rate. This seems to be his tendency; you pull out your pencil and bend over a darkened kneeboard to make a note of it. The ATC tapes tell it something like this:

"Oscar nine zero three going slightly below glide path, slightly left of course . . ."

"Slightly below glide path and holding . . ."

"Going further below — below glide path . . ."

"Below glide path, left of course and correcting . . ."

"Going well below glide path at two miles . . . Oscar nine zero three, check your rate of descent!"

"Well below glide path, too low for safe . . . *Nine zero three execute missed approach immediately!"*

But of course you already have, because on the second "below" call you looked up from your kneeboard, and your heart fibrillated once or twice because the runway lights were suddenly too high on the windscreen; the angle of attack indexer was bright green, and you could smell the darkened ground coming up underneath you. You grab the controls, and at maximum rated thrust with "boards in" the airplane is still sinking. You feel a couple of bumps, but you can sense the bird starting to climb . . . .

Your knees are still vibrating when you crawl out of the cockpit. The plane captain, wide-eyed, is showing you the leaves and branches he's just found in the landing gear assembly . . . .

You don't think anything like that has ever happened? Guess again!

Anyone in the aviation community is use to hearing about our "intensely demanding environment," so used to it, in fact, that the phrase has lost its luster. Nevertheless it applies in spades in the Training Command, and it's worth pausing to consider now and then.

There is, most basically, the overwhelming priority of "bringing 'em back alive," and that, for the instructor pilot, is a question not only of being ahead of the airplane but of the airplane *and* student together. Anyone who has ever been a flight instructor can cite a dozen instances in which an otherwise routine situation became a grueling ordeal simply because he had to sit and watch — a night IFR approach, a wet-runway trap or a crosswind landing. The IP is removed from the data-feedback loop; he cannot directly influence an unfolding situation with his own skill and reflexes. He can only observe what the airplane and the student have already

done, guess what the student will do next and decide when, if at all, he must take the controls. This means he cannot afford to sit back and let the student be the autopilot; rather, he must be twice as alert and twice as far ahead of the airplane as he would be if he had his own grubby mitts on the stick and throttle.

Lt. Col. James H. Wood, in his article "War Stories" discussed the fine line between the instructional technique of letting a student compound his own errors and the irresponsibility of allowing a dangerous situation to ruin a perfectly good day. The fundamental corollary to that distinction is the IP's ability to recognize when a situation has — or is about to — become dangerous. Granted, that determination is not usually difficult to make; on the other hand, it's rarely the "usual" that kills people in airplanes.

It is, for instance, a truism around the Training Command that it is the really good students who will cause most gray hair. The IP lets his guard down because his star student is Chuck Yeager incarnate and obviously has the "big picture." The salty IP's attention drifts, and he picks an inopportune moment to jot down a note (probably something about an excellent no-gyro, partial-panel, emergency-fuel GCA) then he looks up and gags when he finds the airplane rolling into 90 degrees angle-of-bank on a missed-approach.

How about the IP's own stick-and-rudder abilities? Sure he's a Sierra Hotel stick, just ask him. But how far can he really let a beginning formation student press a 50-knots-of-closure rendezvous and still have time to take the airplane and safely execute an underrun? After two, four or six weeks of backseat driving does he still have that fine, practiced touch on the controls? And is he going to be as quick, or is his judgment going to be as sharp, on the third hop of the day as it was on the first?

Instructing requires a raft of virtues, including knowledge, patience, enthusiasm and the ability to communicate, but judgment, that difficult-to-learn and easily recognized quality, is more important than any of these. That means knowing the student, knowing the airplane and knowing oneself. This is what having the "right stuff" means. It means neither pushing — nor shirking — any of those three inseparable subjects. ◄

CORROSION
word search

By AT1 Steven J. Ludwig and AMS1 Thomas J. Eaton, VQ-4

Using the words in the two columns below, circle the appropriate letters to spell each term. Words may be spelled forward, backward, diagonally or up and down. When you are finished, use the remaining letters to find the hidden *corrosion message*. If you are not sure where the words came from, why not look at a copy of NAVAIR 01-1A-509.

Y	T	R	I	D	N	A	S	C	B	O	J
S	E	X	F	O	L	I	A	T	E	D	N
E	T	Y	L	O	R	T	C	E	L	E	N
G	R	I	M	E	H	S	A	W	A	D	H
A	E	L	C	O	R	R	O	S	I	O	N
L	A	L	D	A	N	X	S	A	S	N	I
V	T	E	G	N	I	T	T	I	P	A	E
A	N	O	I	D	R	I	G	N	U	F	G
N	S	N	A	E	L	C	O	R	R	O	L
I	C	T	S	C	R	E	V	I	C	E	I
C	E	S	M	R	O	F	I	L	I	F	B

anode
bilge
cathode
clean
crevice
corrosion
dirty
electrolyte
exfoliate
filiform
fungi
galvanic
grime
N.D.I
oxidate
pitting
sand
stress
treat
wash

Famous Last Words:

"Not to worry. It will blow off when we taxi."

Don't you believe it.

Naval Safety Center
NAS Norfolk, Virginia

prevention is an all hands exercise.

Pick up on it!

Naval Safety Center
NAS Norfolk, Virginia